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# **WATER SUPPLY OUTLOOK FOR WASHINGTON**



**U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE**

Collaborating with

DEPARTMENT OF ECOLOGY STATE OF WASHINGTON

Data included in this report were obtained by the agencies named above in cooperation with Federal, State and private organizations listed inside the back cover of this report.

AS OF  
**APR. 1, 1978**

## TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

*COVER PHOTO: SOME OF THE DATA IN THIS REPORT HAVE BEEN RECEIVED THROUGH THE SOIL CONSERVATION SERVICE'S NEW SNOTEL SYSTEM WHICH TRANSMITS INFORMATION VIA THE SPACE AGED METEOR BURST METHOD FROM DATA SITES TO MASTER STATIONS LIKE THESE.*

### PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 510, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	Room 129, 2221 East Northern Lights Blvd., Anchorage, Alaska 99504
Arizona	Room 3008, Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1220 S.W. Third Ave., Portland, Oregon 97204
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 84138
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82602

### PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P.O. Box 388, Sacramento, California 95802 --- for British Columbia by the Ministry of the Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia V8V 1X5 --- for Yukon Territory by the Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory Y1A 3V1 --- and for Alberta, Saskatchewan, and N.W.T. by the Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta T3C 1A6.





# ***WATER SUPPLY OUTLOOK FOR WASHINGTON***

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

*Issued by*

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SPOKANE, WASHINGTON

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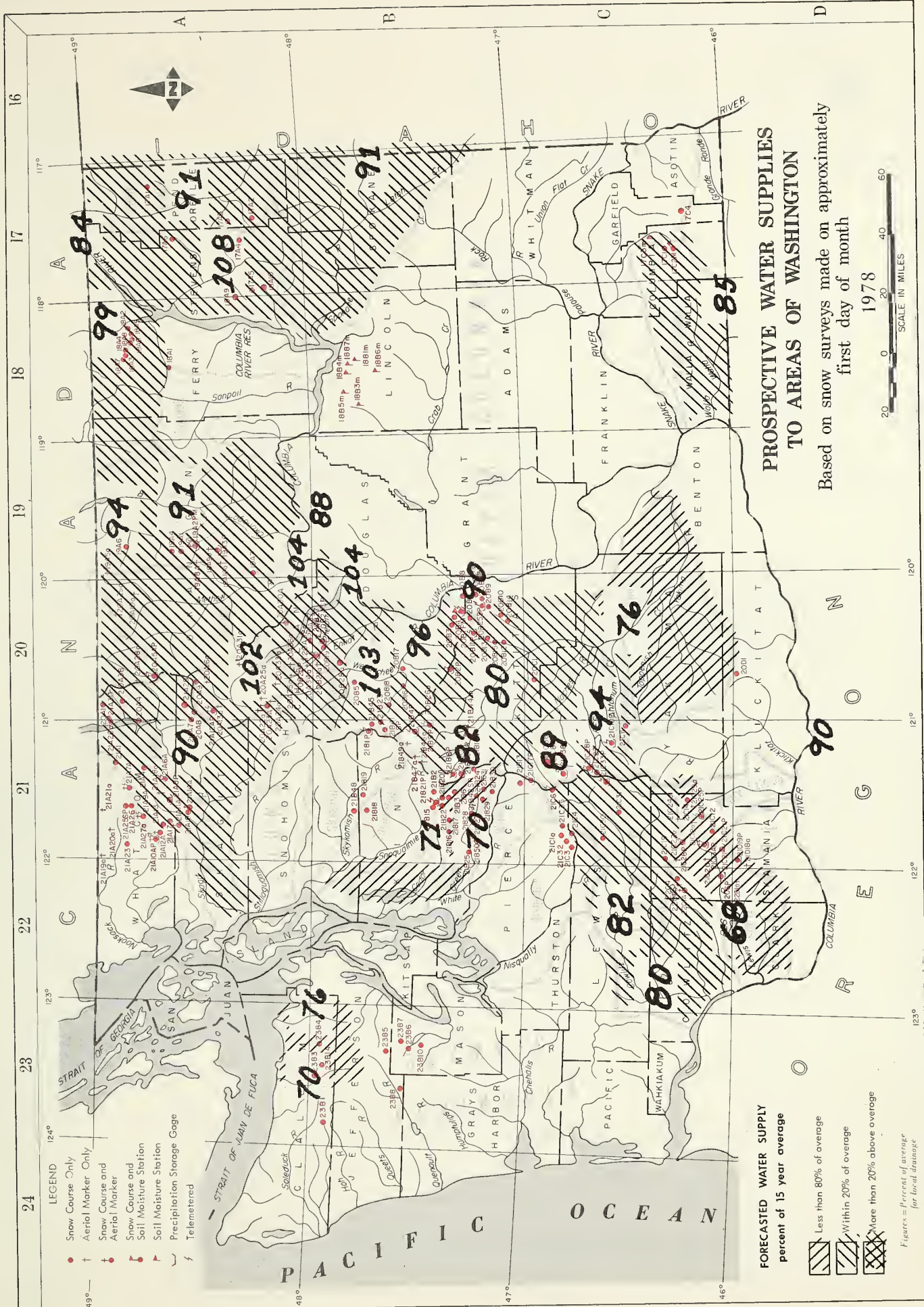


*Report prepared by*

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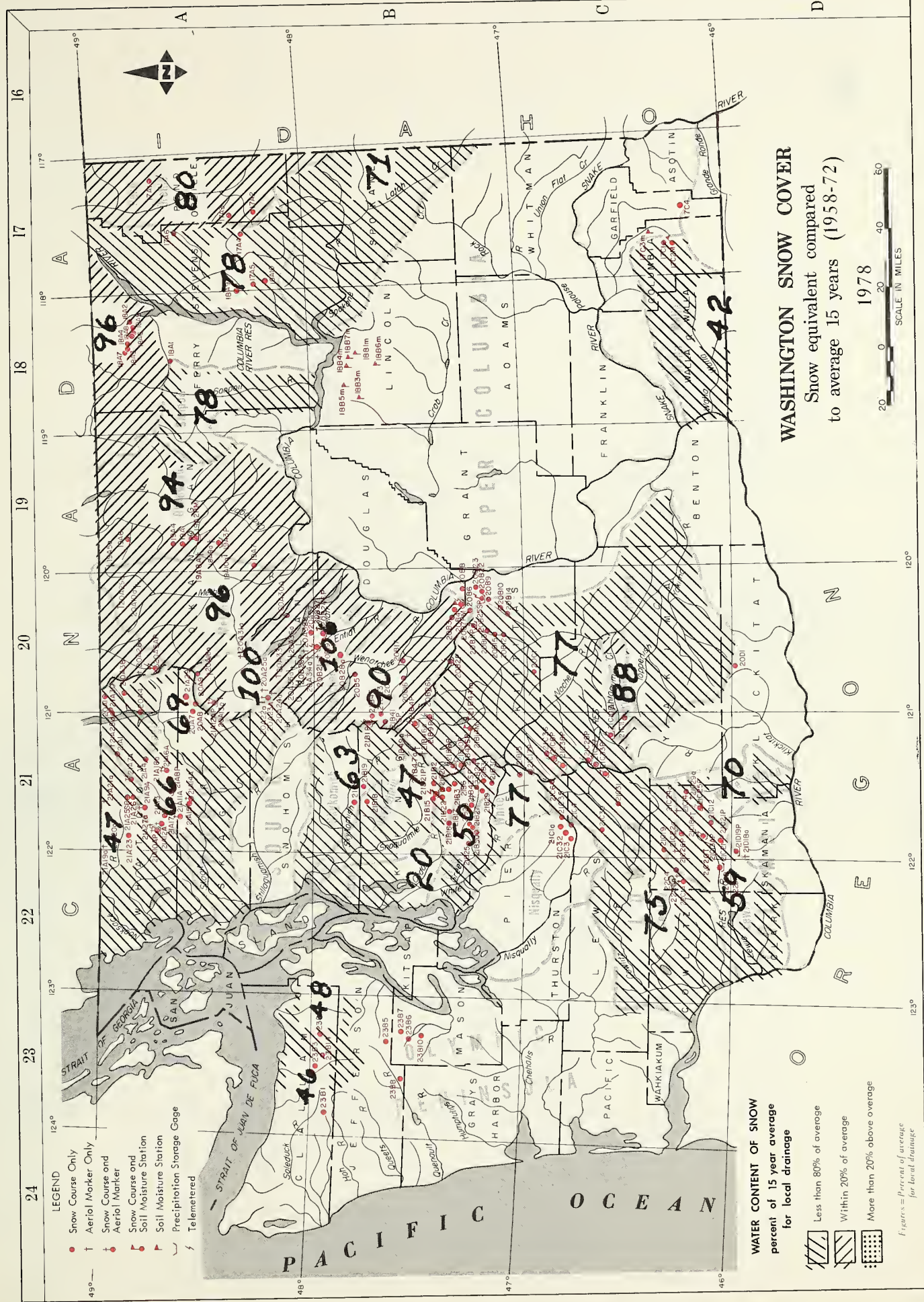




INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS AND PRECIPITATION STORAGE GAGES

UPPER COLUMBIA DRAINAGE				Wenatchee River (continued)				Lewis River (continued)				Cowlitz River				Baker River				Skagit River					
NAME	NUMBER	SEC.	TWP. RANGE ELEV.	NAME	NUMBER	SEC.	TWP. RANGE ELEV.	NAME	NUMBER	SEC.	TWP. RANGE ELEV.	NAME	NUMBER	SEC.	TWP. RANGE ELEV.	NAME	NUMBER	SEC.	TWP. RANGE ELEV.	NAME	NUMBER	SEC.	TWP. RANGE ELEV.		
Pend Oreille River				Trough #2				20825SP				20825P				21A27A				21A4					
Boyer Mountain	1742	7	31N 43E	5250	Colockum Creek	20822	11	20N 20E	5300	Divide Meadow	21C29A	21	9N 10E	5600	Beaver Creek Trail	21A4	35	39N 12E	2200						
Bunchgrass Meadow	1741	24	37N 44E	5000	Colockum Creek Upper	20823	1	20N 20E	4500	Grand Meadow	21C25P	28	8N 9E	3500	Beaver Pass	21A1	9	39N 12E	3680						
Winchester Creek	1743	30	33N 43E	2970	Colockum Creek Lower	20823	1	20N 20E	4500	Lone Pine Shelter	21C26P	8	9N 7E	3800	Brown Top	21A28A	26	40N 12E	6000						
Kettle River				Squilchuck Creek				Squilchuck Creek				New Huddy River				Freezout Creek Trail				Freezout Meadows New					
Boulder Road	1842	36	30N 36E	1450	Beehive Springs	2083	12	21N 19E	4400	Oldman Pass	21D19P	22	6N 7E	3100	Freezout Meadows New	20A1	14	40N 14E	3500						
Butte Creek	1843	28	30N 35E	4070	Scout-A-Vista	2084	18	21N 20E	3400	Plains of Abraham	22C1A	35	9N 5E	4400	Granite Creek	20A38	8	40N 16E	5000						
Cabin Creek	1848	3	38N 32E	3170	Stemilt Creek	2088	34	21N 20E	4450	Smith Creek Road	22C2A	29	6N 7E	3100	Meadows Cabins	20A39	25	36N 16E	3500						
Goat Creek	1848	23	38N 35E	3105	Jump-Off	2086	30	21N 20E	5000	Spencer Meadow	21C20A	16	8N 7E	3400	New Horsemoe Lake	20A39	29	36N 14E	1900						
Snow Caps Creek	1845	5	38N 36E	2350	Stemilt Slide	2087PM	30	21N 20E	4400	Surprise Lakes	21C13AP	14	7N 8E	4250	Thunder Basin	20A7	19	40N 14E	2300						
Snow Caps Trail	1846	3	38N 36E	2720	Upper Wheeler	2087PM	30	21N 20E	4400	Table Mountain	21C24A	20	9N 9E	4200		21A30	10	35N 14E	4200						
Summit G. S.	1847	20	39N 35E	4600						Timbered Peak	21D18A	36	6N 6E	3000											
Colville River				Crab Creek				Yakima River				Cowlitz River				Baker River				Skagit River					
Baird	1746	19	36N 42E	3215	Creston-Kunz	1891m	32	27N 34E	2440	Ahtatum R. S.	21C11	24	12N 14E	3100	Cayuse Pass	21C16	15	16N 10E	5300	Bald Mountain	21A19A	7	40N 7E	4400	
Carlson	1849	34	32N 38E	2885	Jack Woods	1895m	28	27N 31E	2750	Big Boulder Creek	21C12	35	23N 14E	3200	Mosquito Meadows	21C19	33	10N 7E	4100	Canyon	21A20A	20	40N 7E	5100	
Chewelah	1744	11	32N 41E	4925	Krause	1894m	21	27N 33E	2470	Bumping Lake	21C13	13	16N 12E	3450	Ohmapi Creek	21C23	28	15N 10E	2200	Glacier Creek	21A26	17	39N 9E	4300	
Stranger Mountain	1745	26	31N 38E	4950	Sherfels	1895m	17	27N 32E	2378	Bumping Lake New	21C16	3	16N 12E	3450	Packman Lake	21C31	21	13N 10E	2870	Panotama New	21A26	17	39N 9E	4300	
Togo	18410	6	29N 38E	3370	Sherman	1897m	24	27N 35E	2440	Cooke Creek	20810	17	19N 20E	5370	Pigtail Peak	21C33P	11	13N 11E	5900	Panotama Snow Pillow	21A25SP	17	39N 9E	4300	
Sanpoil River				Cooke Creek				Nisqually River				White River				Morton Lake				Nisqually River					
Sherman Creek Pass	1841	19	36N 35E	5350	Domery Flat	20810	17	19N 20E	4123	Domery Flat	21B44m	28	24N 14E	2200	Ghost Forest	21C4	23	15N 8E	4550	Watson Lakes	21A8P	25	37N 9E	4500	
Clark	19A8A	2	36N 23E	7000	Fish Lake	21B4P	28	24N 14E	3371	Fish Lake	21B4P	28	24N 14E	3371	Longnate	21C5	29	15N 8E	2760	Bald Mountain	21A19A	7	40N 7E	4400	
Muckamuck	19A9A	20	36N 24E	6750	Green Lake	20811P	3	21N 13E	6000	Green Lake	21C10P	3	21N 13E	6000	Paradise Park (New)	21C53	13	15N 8E	5500	Canyon	21A20A	20	40N 7E	5100	
Mutton Creek No. 1	19A1	30	37N 24E	5700	Grouse Camp	20812P	34	20N 19E	2930	Grouse Camp	20811P	3	21N 13E	6000	Stem Glade	21C1	13	15N 8E	5050	Glacier Creek	21A26	17	39N 9E	4300	
Mutton Creek No. 2	19A4	19	37N 24E	6000	High Creek	20813	4	20N 19E	3875	High Creek	20812P	34	20N 19E	2930	Corral Pass	21B13	30	18N 11E	6000	Panotama New	21A26	17	39N 9E	4300	
Pasayten	20A28A	32	40N 18E	4300	Joe Lake	21B14A	15	20N 14E	2200	Joe Lake	21B14A	15	20N 14E	2200		21C1	13	15N 8E	5050	Panotama Snow Pillow	21A25SP	17	39N 9E	4300	
Pasty Creek	19A3P	18	35N 24E	4500	Lake Cle Elum	21B14A	15	20N 14E	2200	Lake Cle Elum	21B14A	15	20N 14E	2200		21C1	13	15N 8E	5050	Twin Lakes	21A21A	16	40N 9E	5200	
Salmon Meadows	19A2PM	33	37N 24E	4500	Lemah Creek	21B14A	15	20N 14E	2200	Lemah Creek	21B14A	15	20N 14E	2200		21C1	13	15N 8E	5050						
Starvation Mtn.	19A10A	15	35N 23E	6750	Manastash	20C1	24	17N 16E	3935	Manastash	20C1	24	17N 16E	3935		21C1	13	15N 8E	5050						
Touts Coulee	19A6	30	39N 25E	2845	Nanum	20C11	24	17N 16E	3935	Nanum	20C11	24	17N 16E	3935		21C1	13	15N 8E	5050						
Methow River				Trail Creek				Green River				White River				Dungeness River				Dungeness River					
Billy Goat Pass	20A10A	10	38N 20E	6400	Trail Creek	20814	20	19N 20E	3360	Tunnel Avenue	21B18P	13	21N 11E	4450	Deer Park	23B4	1	28N 5W	5200	Morse Creek	23B14	31	29N 6W	4500	
Dollar Watch	20A29A	8	39N 20E	7000	Walters Flat	20815	22	20N 19E	3360	Walters Flat	20815	22	20N 19E	3360		23B14	31	29N 6W	4500						
Harts Pass	20A3AP	7	37N 18E	6500	White Pass (East Side)	21C28P	2	13N 13E	3024	White Pass (East Side)	21C28P	2	13N 13E	3024		23B14	31	29N 6W	4500						
Horseshoe Basin	19A5A	15	40N 23E	7000	White Pass (Leach Lake)	21C27	1	13N 11E	4500	White Pass (Leach Lake)	21C27	1	13N 11E	4500		23B14	31	29N 6W	4500						
Loup Loop	19A7	36	34N 23E	4650																					
Chelon Lake Basin				Lower Columbia Drainage				Lower Columbia Drainage				Green River				Morse Creek				Morse Creek					
Cloudy Pass	20A22A	12	31N 15E	6500	Asotin Creek	17C4	9	18N 40E	5700	Asotin Creek	17C4	9	18N 40E	5700	Green River	21B24	18	20N 11E	1800	Cox Valley	23B14	31	29N 6W	4500	
Greenwood Flat	20A25A	8	31N 16E	5270	Spruce Springs	17C4	9	18N 40E	5700	Spruce Springs	17C4	9	18N 40E	5700		21B24	18	20N 11E	1800						
Little Meadows	20A25A	8	31N 16E	5270	Mill Creek	17C3m	2	9N 40E	3370	Mill Creek	17C3m	2	9N 40E	3370		21B24	18	20N 11E	1800						
Loup Lake	20A25A	8	31N 16E	5270	Couse	17C1	11	9N 40E	4030	Couse	17C3m	2	9N 40E	3370		21B24	18	20N 11E	1800						
Loup Lake Flat	20A25A	8	31N 16E	5270	Homestead	17C1	11	9N 40E	4030	Homestead	17C1	11	9N 40E	4030		21B24	18	20N 11E	1800						
Park Creek Flat	20A12A	18	34N 16E	4600	Martin Springs (Helmers SW)	17C2M	23	9N 40E	4400	Martin Springs (Helmers SW)	17C2M	23	9N 40E	4400		21B24	18	20N 11E	1800						
Park Creek Ridge	20A12A	18	34N 16E	4600	Martin Springs (Helmers SW)	17C2M	23	9N 40E	4400	Martin Springs (Helmers SW)	17C2M	23	9N 40E	4400		21B24	18	20N 11E	1800						
Petersons	20A16A	3	34N 17E	4780	Klickitat River	2001	21	6N 17E	4050	Klickitat River	2001	21	6N 17E	4050		21B24	18	20N 11E	1800						
Ridgway	20A16A	3	34N 17E	4780	Satus Pass	2001	21	6N 17E	4050	Satus Pass	2001	21	6N 17E	4050		21B24	18	20N 11E	1800						
Safety Harbor	20A30A	32	31N 20E	6300	White Salmon River	21C12	35	7N BE	4000	White Salmon River	21C12	35	7N BE	4000		21B24	18	20N 11E	1800						
War Creek Pass	20A31A	34	33N 18E	6500	Cultus Creek	21C12	35	7N BE	4000	Cultus Creek	21C12	35	7N BE	4000		21B24	18	20N 11E	1800						
Entiat River				Lewis River				Snoqualmie River				Snoqualmie River				Skykomish River				Skykomish River					
Blue Creek G.S.	20B28A	19	28N 18E	5425	Blue Lake	21C22A	19	9N BE	4800	Blue Lake	21C22A	19	9N BE	4800	Snoqualmie River	21B48	31	27N 1E	3500	Alpine Meadow	21B48	31	27N 1E	3500	
Brief	20B19	34	28N 17E	1600	Bob's Trail	21C21P	25	8N 7E	2200	Bob's Trail	21C21P	25	8N 7E	2200		21B48	31	27N 1E	3500	Ohallie Meadows	21B48	31	27N 1E	3500	
Entiat Meadows	20A33A	28	31N 17E	4540	Calamity Bridge	21C18A	24	9N 9E	4200	Calamity Bridge	21C18A	24	9N 9E	4200		21B48	31	27N 1E	3500	South Fork Tolt	21B48	31	27N 1E	3500	
Entiat River Trail	20A34A	2	29N 17E	3325	Council Pass	2				Council Pass	2					21B48	31	27N 1E	3500						
Four Mile Ridge	20B27A	15	28N 19E	6800												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500						
Pope Ridge	20B28P	22	29N 18E	6510												21B48	31	27N 1E	3500			</			





NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.

LEGEND	
NUMBERING SYSTEM	EXAMPLE
21A7	SNOW COURSE ONLY
21A7 <sup>a</sup>	AERIAL MARKER ONLY
21A7A	SNOW COURSE AND AERIAL MARKER
21A7M	SNOW COURSE AND SOIL MOISTURE
21A7 <sup>m</sup>	SOIL MOISTURE STATION
21A7P	SNOW COURSE AND PRECIPITATION
21A7 <sup>p</sup>	PRECIPITATION STORAGE GAGE
21A7SP	SNOWPILLON



# WATER SUPPLY OUTLOOK

State of Washington

April 1, 1978

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\*\*\*\*\*  
\*\* There has been a general decrease of the snow pack from that \*\*  
\*\* which has been previously reported. April 1 generally is the \*\*  
\*\* date when maximum snow water equivalent is measured over \*\*  
\*\* 90 percent of the snow courses. A few low elevation courses \*\*  
\*\* have March 1 maximums and a couple of high elevation courses \*\*  
\*\* have a May 1 maximum. This year the maximum occurred on \*\*  
\*\* March 1. Only a couple of high elevation snow courses showed \*\*  
\*\* an increase from that which occurred last month. The end \*\*  
\*\* result of this lack of input during the month is a general \*\*  
\*\* reduction of water supply forecasts from that reported last \*\*  
\*\* month. This reduction has been from 5 to 15 percent through- \*\*  
\*\* out the state. Precipitation was above normal only in the \*\*  
\*\* Upper Columbia Drainage and along the east side of the \*\*  
\*\* Cascades. The east side rainfall was only 2 percent above \*\*  
\*\* normal while the Upper Columbia was 10 percent above. Runoff \*\*  
\*\* was generally well above normal over most of the state with \*\*  
\*\* a few low elevation watersheds reporting subnormal outflows. \*\*  
\*\* Several of the watersheds, mainly on the west side of the \*\*  
\*\* Cascades and on the Olympic Peninsula, have less snow pack \*\*  
\*\* this year as of April 1 than occurred last year at this time. \*\*  
\*\*  
\*\*\*\*\*  
\*\*\*\*\*

## SNOW COVER

There are only two basins in the state and tributary areas that have normal or above snow packs as of April 1. These two drainages are the Chelan and Entiat on the east side of the Cascades. Snow packs in the Upper Columbia Drainage range from a low of 29 percent below normal to 6 percent above. Along the Lower Columbia Drainage, the snow cover ranges from 58 percent below normal on the Mill Creek Drainage to 25 percent below normal for the Cowlitz River. The Puget Sound Drainage has a snow cover, as of April 1, that ranges from 80 percent below average to 23 percent below normal. On the Olympic Peninsula, the snow pack in this area ranges from 54 to 52 percent below average. Most drainages do have more snow this year than last year at this time although, as stated above, the Cedar, Snoqualmie, and Nooksack on the Puget Sound Drainage, the Elwha and Dungeness on the Olympic Peninsula, and the Mill Creek on the Lower Columbia have less than last years record low snow packs.

## RESERVOIRS

Most of the reservoirs are in good shape as of April 1. The five Yakima irrigation reservoirs have 20 percent more water in storage than normal for this time of year. Lake Roosevelt has 1 percent above average water while Ross has 5 percent below normal. The Chelan Lake has water in storage that is 13 percent below normal. The two small reservoirs in the Okanogan Drainage, Conconully and Salmon, are in sad shape and these reservoirs will fill only with perfect weather conditions, that is, well above normal rainfall in the area above them.

## PRECIPITATION

Rainfall during the month ranged from 50 percent below normal in the Pend Oreille-Spokane Drainage to 10 percent above normal in the Upper Columbia above Castlegar. The winter precipitation, November through March, now ranges from 14 percent below normal for the Upper Columbia Drainage to a high of 43 percent above for the central Washington drainage division, this as reported by the National Weather Service. The Bureau of Reclamation reports precipitation at their five irrigation reservoirs to be 79 percent of normal during the month of March and 10 percent above normal since September 1.

## STREAMFLOW

Flows were generally above normal, ranging from 38 percent below normal for the Cowlitz River at Castlerock to a high of 44 percent above normal for the Chelan River, adjusted for storage. Generally, it was the low elevation watersheds that had the poorer runoffs. Streamflow forecasts have been reduced from that reported last month and now range from a low of 35 percent below normal to a high of 8 percent above. Numerical forecasts can be found on the following pages.



# STREAMFLOW FORECASTS - March, 1978

The following summarized runoff forecasts are based principally on mountain snow-cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts. Streamflow figures for 1977 are preliminary and subject to revision.

Basin, Stream and Station	Forecast Runoff 1978	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast period	1977	1976	1975	15-Yr. Average 58-72
<u>COLUMBIA BASIN</u>							
<u>COLUMBIA RIVER SYSTEM</u> **							
Columbia River	38900	84	Apr-Sept	31583	53937	41101	46410
at Birchbank <u>1/</u>	31500	84	Apr-July	23839	38979	32944	37548
	23100	84	Apr-June	18040	26054	22429	27549
Columbia River	60400	88	Apr-Sept	41805	80974	66501	69020
at Grand Coulee <u>1/</u>	51100	87	Apr-July	32813	62715	55870	58368
	40200	87	Apr-June	26413	46556	41377	46049
Columbia River	67800	90	Apr-Sept	43659	86849	73553	75290
bl. Rock Island Dam <u>1/</u>	57700	90	Apr-July	34392	67890	62727	64181
	45500	90	Apr-June	27740	50520	46759	50594
Columbia River	93700	90	Apr-Sept	54130	122876	108901	104600
at The Dalles, Or <u>1/</u>	80700	90	Apr-July	42939	99965	94195	89875
	65800	90	Apr-June	35577	79164	73012	73143
<u>PEND OREILLE RIVER SYSTEM</u> **							
Pend Oreille River	14500	91	Apr-Sept	6041	17638	16946	15950
bl. Box Canyon	13300	91	Apr-July	5312	15979	15271	14677
	11600	91	Apr-June	4816	13687	11814	12767
<u>KETTLE RIVER SYSTEM</u>							
Kettle River	1850	99	Apr-Sept	1145	2434	1860	1873
nr. Laurier	1770	99	Apr-July	1105	2112	1779	1794
	1650	101	Apr-June	1037	1826	1592	1640
Colville River	160	108	Apr-Sept		123	225	148
at Kettle Falls	140	102	Apr-July		106	203	137
	130	101	Apr-June		98	187	128

1/ Observed flow corrected for storage in any of the following reservoirs which are above the station: Kootenay Lake, Hungry Horse, Flathead Lake, Pend Oreille Lake, F. D. Roosevelt Lake, Lake Chelan, Coeur d'Alene Lake, Brownlee, Noxon Reservoir and pumpage at F. D. Roosevelt Lake.

\*\* Forecasts made by National Weather Service, River Forecast Center, Portland, OR

Basin, Stream and Station	Forecast Runoff 1978	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast period	1977	1976	1975	15-Yr Average 58-72
<u>SPOKANE RIVER SYSTEM***</u>							
Spokane River	2750	91	Apr-Sept	1066	3215	3418	2982
at Post Falls, ID 2/	2660	92	Apr-July	1014	3069	3275	2899
	2540	92	Apr-June	960	2884	3033	2773
<u>OKANOGAN RIVER SYSTEM **</u>							
Similkameen River	1420	94	Apr-Sept	645	1944	1434	1516
nr. Nighthawk	1330	93	Apr-July	605	1720	1339	1424
	1140	93	Apr-June	547	1347	1092	1222
Okanogan River	1570	91	Apr-Sept	708	2185	1582	1723
nr. Tonasket	1440	91	Apr-July	644	1836	1437	1582
	1230	91	Apr-June	583	1382	1181	1349
<u>METHOW RIVER SYSTEM **</u>							
Methow River	1070	104	Apr-Sept		1205	992	1031
nr. Pateros	990	103	Apr-July		1047	911	963
	860	103	Apr-June		802	728	832
<u>CHELAN RIVER SYSTEM</u>							
Chelan River	1300	104	Apr-Sept	599	1466	1364	1253
at Chelan 3/	1130	102	Apr-July	481	1184	1210	1112
	880	100	Apr-June	403	836	858	881
Stehekin River	920	100	Apr-Sept	494	1010	1040	904
at Stehekin	780	100	Apr-July	382	787	796	776
	595	99	Apr-June	311	523	526	600
Entiat	260	109	Apr-Sept		310	268	239
nr. Ardenvoir	240	109	Apr-July		266	244	220
	200	111	Apr-June		190	182	180
<u>WENATCHEE RIVER SYSTEM</u>							
Wenatchee River	1350	103	Apr-Sept	633	1510	1396	1312
at Plain	1170	99	Apr-July	542	1263	1262	1187
	1000	105	Apr-June	479	891	924	956
Wenatchee River	1710	96	Apr-Sept	839	2074	1920	1786
at Peshastin	1660	102	Apr-July	730	1746	1738	1629
	1360	103	Apr-June	653	1238	1279	1324
Stemilt Basin	125*		May-Sept		144*	134*	138*
nr. Wenatchee							
Icicle Creek	360	97	Apr-Sept				371
nr. Leavenworth	330	97	Apr-July				342
	270	97	Apr-June				279

\*\* Forecasts made by National Weather Service, River Forecast Center, Portland, OR

\*\*\* Forecasts made by Jack A. Wilson, Soil Conservation Service, Boise, Idaho.

2/ Observed flow corrected for storage in Coeur d'Alene Lake and diversions by Spokane Valley Farms Company and Rathdrum Prairie Canals.

3/ Observed flow corrected for storage in Lake Chelan.

\* Thousands of Miners' Inches.

Basin, Stream and Station	Forecast Runoff 1978	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore cast period	1977	1976	1975	15-Yr. Average 58-72
<u>YAKIMA RIVER SYSTEM</u>							
Yakima River	115	82	Apr-Sept	80	157	168	142
nr. Martin <u>4/</u>	105	80	Apr-July	70	141	154	131
	95	82	Apr-June	67	117	127	116
Yakima River	775	80	Apr-Sept		1091	1112	968
at Cle Elum <u>5/</u>	700	80	Apr-July		980	1012	877
	650	85	Apr-June		807	852	764
Yakima River	1640	76	Apr-Sept	802	2521	2610	2161
nr. Parker <u>6/</u>	1470	75	Apr-July	657	2205	2367	1960
	1300	75	Apr-June	612	1810	2021	1739
Kachess River	95	76	Apr-Sept	60	142	154	125
nr. Easton <u>7/</u>	85	72	Apr-July	55	131	145	118
	80	75	Apr-June	54	109	120	106
Cle Elum River	420	88	Apr-Sept	248	561	539	477
nr. Roslyn <u>8/</u>	380	88	Apr-July	211	484	492	437
	330	89	Apr-June	192	370	388	372
Bumping River	130	89	Apr-Sept	65	175	179	146
nr. Nile <u>9/</u>	120	89	Apr-July	60	152	163	134
	100	89	Apr-June	55	109	119	112
American River	115	91	Apr-Sept		132	149	128
nr. Nile	110	93	Apr-July		116	137	118
	95	95	Apr-June		86	104	100
Tieton River	230	94	Apr-Sept	123	302	299	247
at Tieton Dam <u>10/</u>	190	90	Apr-July	94	242	253	211
	155	90	Apr-June	77	179	187	172
Naches River	800	90	Apr-Sept		1046	1054	889
nr. Naches <u>11/</u>	720	89	Apr-July		908	952	810
	610	87	Apr-June		717	761	698
Ahtanum Creek	45	94	Apr-Sept		51	57	48
nr. Tampico <u>12/</u>	40	91	Apr-July		45	51	44
	35	90	Apr-June		37	44	39

4/ Observed flow corrected for storage in Lake Keechelus.

5/ Observed flow corrected for storage in Keechelus, Kachess and Cle Elum Lakes. and diversion by Kittitas Canal.

6/ Observed flow corrected for storage in Keechelus, Kachess, Cle Elum, Bumping and Rimrock Lakes and diversions by Roza, New Reservation, Sunnyside, Kittitas, and Tieton Canals.

7/ Observed flow corrected for storage in Lake Kachess.

8/ Observed flow corrected for storage in Lake Cle Elum.

9/ Observed flow corrected for storage in Bumping Lake.

10/ Observed flow corrected for storage in Rimrock Lake.

11/ Observed flow corrected for storage in Bumping and Rimrock Lakes and diversions by Tieton, Selah Valley, Wapatox Canals and City of Yakima.

12/ Observed flow of North and South Forks (Combined).



Basin, Stream and Station	Forecast Runoff 1978	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast period	1977	1976	1975	15-Yr. Average 58-72
<u>LOWER COLUMBIA RIVER SYSTEM</u>							
Mill Creek	23	85	Apr-Sept		41	39	27
nr. Walla Walla	20	83	Apr-July		36	34	24
	17	81	Apr-June		32	30	21
Lewis River	900	68	Apr-Sept	1040	1285	1188	1319
at Ariel <u>13/</u>	750	65	Apr-July	831	1130	1022	1151
	670	65	Apr-June	761	990	885	1028
Cowlitz River **	1720	82	Apr-Sept	1587	2296	2127	2101
bl. Mayfield Dam	1510	82	Apr-July		1963	1852	1846
	1290	82	Apr-June		1584	1451	1578
Cowlitz River **	2230	80	Apr-Sept	2172	2924	2646	2773
at Castle Rock <u>14/</u>	1950	81	Apr-July	1778	2493	2278	2416
	1690	81	Apr-June	1603	2063	1816	2083
<u>OLYMPIC PENINSULA</u>							
<u>DUNGENESS RIVER SYSTEM</u>							
Dungeness River	125	76	Apr-Sept		160	149	165
nr. Sequim	110	80	Apr-July		128	118	137
	80	77	Apr-June		91	82	104
<u>PUGET SOUND</u>							
<u>SKAGIT RIVER SYSTEM</u>							
Skagit River	2180	90	Mar-Aug		2841	2339	2418
at Newhalem <u>15/</u>							
<u>ELWHA RIVER SYSTEM</u>							
Elwha River	380	70	Apr-Sept		613	544	546
nr. Port Angeles	310	68	Apr-July		492	435	456
<u>GREEN RIVER SYSTEM</u>							
Green River	270	70	Mar-Sept		372	418	386
bl. Howard Hanson Dam <u>16/</u>							
<u>CEDAR RIVER SYSTEM</u>							
Cedar River	65	71	Apr-Sept		91	101	91
nr. Cedar Falls							

13/ Observed flow corrected for storage in Lake Merwin, Yale and Swift Reservoirs.

14/ Observed flow corrected for storage in Mayfield Reservoir.

15/ Observed flow corrected for storage in Diablo, Ross and Gorge Reservoirs.

\*\* Forecasts made by National Weather Service, River Forecast Center, Portland, OR

16/ Observed flow corrected for storage in Howard Hanson Dam.



# COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

The following tabulation of Washington stream basins presents the water content of the snow about April 1, 1978 as percent of the same date in 1977 and 1976 and average of record.

Tributary Basin	No. of Courses Average	Snow Water Expressed as percent of		
		1977	1976	1958-72 Avg.

## UPPER COLUMBIA BASIN

Pend Oreille	19	176	80	80
Kettle	16	173	82	96
Colville	4	174	84	78
Spokane	14	162	68	71
Sanpoil	1	202	99	78
Okanogan	38	223	94	94
Methow	9	435	122	96
Chelan	3	214	75	100
Entiat	11	297	88	106
Wenatchee	9	220	70	90
Yakima	19	232	74	77
Ahtanum	2	271	90	88

## LOWER COLUMBIA

Mill Creek	2	82	29	42
White Salmon	2	174	64	70
Lewis	10	130	53	59
Cowlitz	3	198	72	75

## PUGET SOUND

White	3	205	77	77
Green	5	133	43	50
Cedar	1	42	15	20
Snoqualmie	3	93	36	47
Skykomish	3	157	59	63
Skagit	16	162	48	69
Baker	8	139	52	66
Nooksack	5	94	48	47

## OLYMPIC PENINSULA

Elwha	1	84	36	46
Dungeness	1	92	-	48
Morse Creek	1	126	20	-

RESERVOIR STORAGE - 1000 Acre Feet

BASIN OR STREAM	RESERVOIR	USABLE 1/ CAPACITY	Measured April 1			
			1978	1977	1976	Normal*
COLUMBIA						
Spokane	Coeur d'Alene Lake	225.1	277.8	30.3	118.3	174.1
Columbia	Franklin D. Roosevelt Lake	5232.0	1842.8	1673.1	1196.3	1821.8
Columbia	Banks Lake	714.9	682.9	566.1	704.2	581.4
Okanogan	Conconully Reservoir	13.0	4.2	8.8	11.3	11.8
Okanogan	Salmon Lake	10.5	6.2	9.3	9.8	7.5
Chelan	Lake Chelan	676.1	156.0	205.4	377.7	179.3
YAKIMA						
Yakima	Keechelus Lake	157.8	158.0	91.0	129.1	107.8
Kachess	Kachess Lake	239.0	215.9	214.4	207.6	190.2
Cle Elum	Lake Cle Elum	436.9	315.0	431.0	321.9	283.2
Bumping	Bumping Lake	33.7	24.4	13.6	5.4	11.4
Tieton	Rimrock Lake	198.0	169.3	139.8	151.4	141.7
PUGET SOUND						
Skagit	Ross Reservoir	1404.1	729.5	468.1	861.4	768.5
Skagit	Diablo Reservoir	90.6	86.8	87.1	89.9	85.5
Skagit	Gorge Reservoir	9.8	8.3	8.3	8.2	-

<sup>1/</sup> Based on Active Storage

\* 15-Year Average 1958-72

# SOIL MOISTURE - April

Drainage Basin and Station	Number	Elev.	Profile Depth	Inches Total Capacity	Soil Moisture Content Inches as of April 1		
					1978	1977	1976
<u>OKANOGAN</u>							
Salmon Meadows	19A2M	4500	48	5.4	-	2.0	3.4
Trout Creek	3-M	3600	48	7.3	-	3.4	-
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	-	-	-
Lake Cle Elum	21B14M	2200	48	12.8	-	-	-
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	-	-	-
Helmers	17C2M	4400	48	12.0	-	-	-
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	7.1	7.9	12.6

# FALL SOIL MOISTURE

Drainage Basin and Station	Number	Elev.	Profile Depth	Inches Total Capacity	Soil Moisture Content (Inches) as of Oct. 1		
					1977	1976	1975
<u>OKANOGAN</u>							
Salmon Meadows	19A02M	4500	48	5.4	-	3.4	3.2
Trout Creek	3-M	3600	48	7.3	3.2	3.4	3.1
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	-	-	-
Lake Cle Elum	21B14M	2200	48	12.8	-	-	-
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	-	-	7.3
Helmets	17C2M	4400	48	12.0	-	-	6.5
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	6.6	-	8.6

# PRECIPITATION 1/

## Division Average Observations and Departures

Drainage Divisions	FALL		WINTER	
	Sept-Oct Observed	1977 <u>2/</u> Departure	Nov. 1977 - Mar. 1978 <u>2/</u> Observed	Departure
Columbia in Canada	3.41	-1.61	13.30	-2.21
Pend Oreille - Spokane	4.10	+0.06	17.28	-0.27
Northeastern Washington	2.06	-0.41	10.62	+1.22
Southeastern Washington	2.51	0.0	11.25	+0.82
Central Washington	1.08	+0.11	7.55	+2.27
North Central Washington	1.39	-0.21	8.13	+1.59
Northwest Slope Cascades	11.16	-2.05	52.34	-3.05
Southwest Slope Cascades	9.42	+0.74	40.82	-0.82
Northeastern Washington		- Lower Spokane, Colville, Sanpoil and Lower Kettle Drainages.		
Southeastern Washington		- Touchet, Tucannon and Palouse Drainages.		
Central Washington		- Yakima, Wenatchee and Chelan Drainages.		
North Central Washington		- Methow and Okanogan Drainages.		
Northwest Slope Cascades		- Puget Sound Drainages.		
Southwest Slope Cascades		- Lower Columbia Drainages.		

1/ - Preliminary analysis by National Weather Service from data furnished by Meteorological Services of Canada and the National Weather Service.

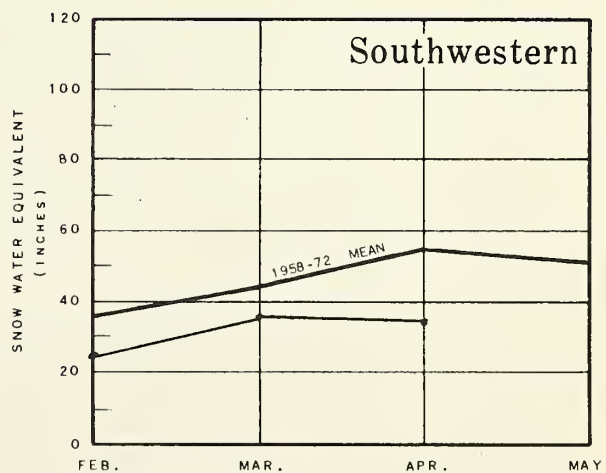
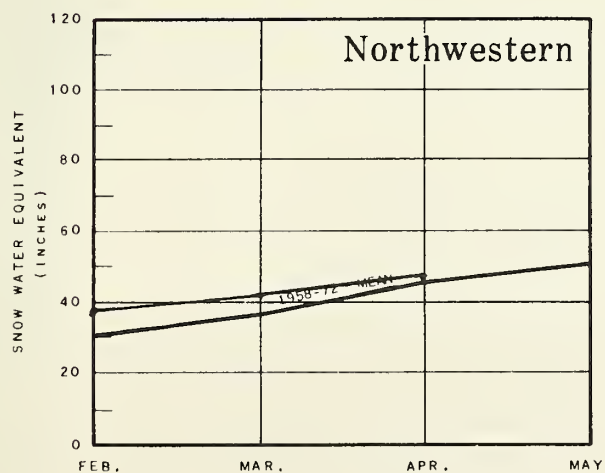
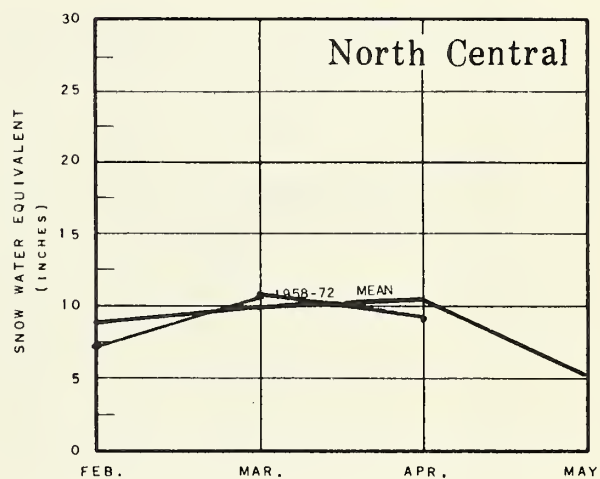
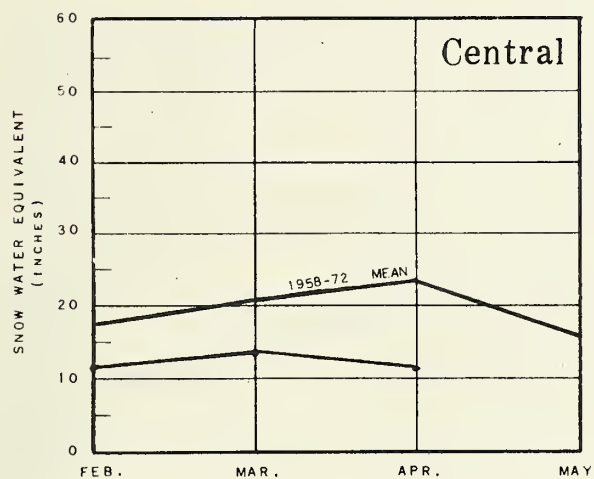
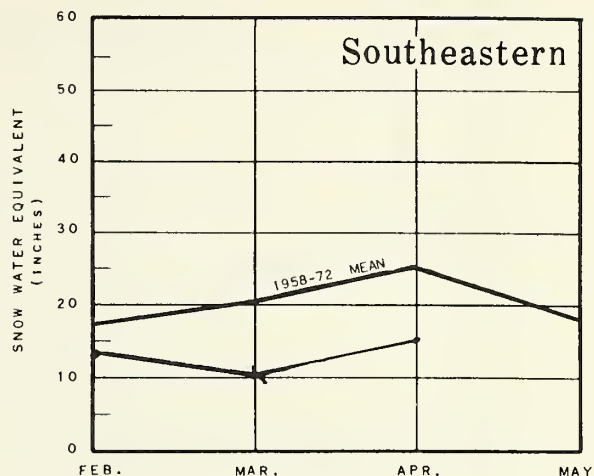
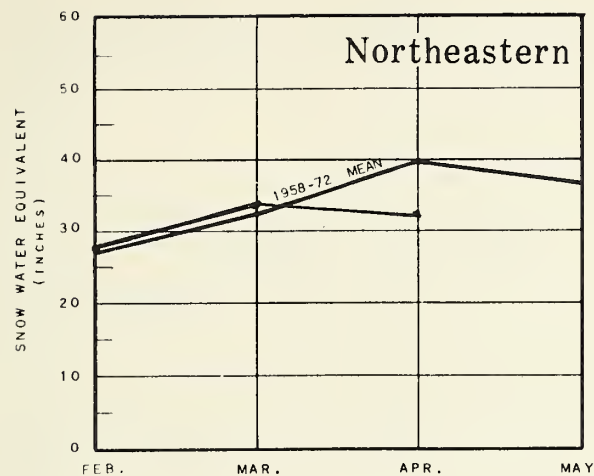
2/ - Departure from 15-year (1958-72) drainage division average.



# WASHINGTON SNOW COVER

1978

## DRAINAGE AREAS

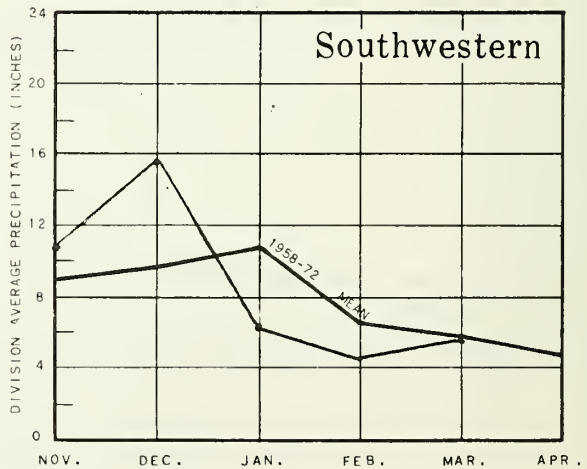
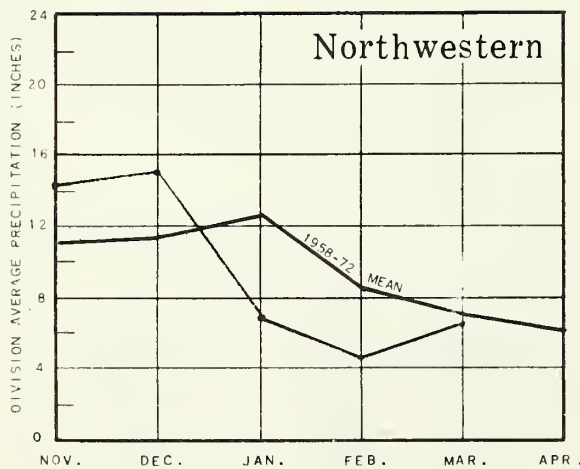
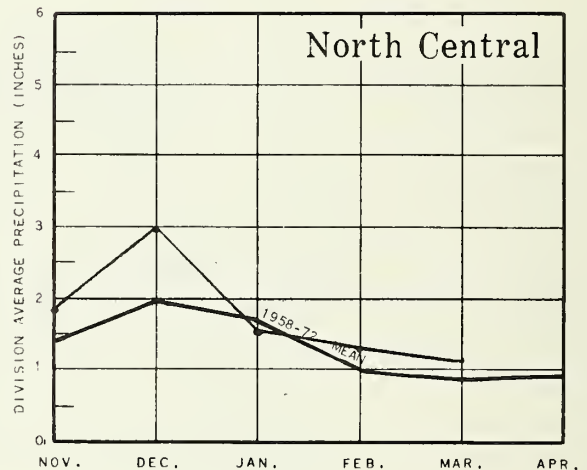
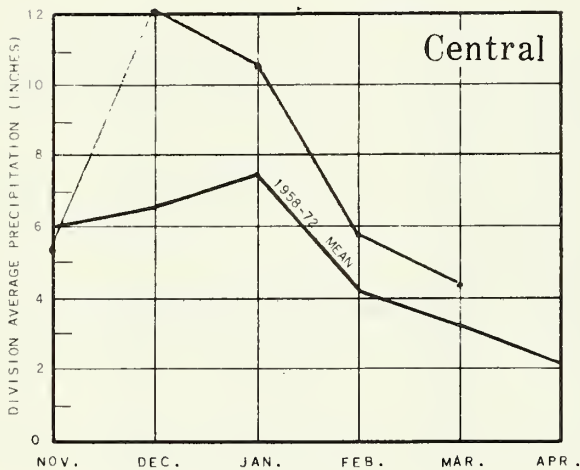
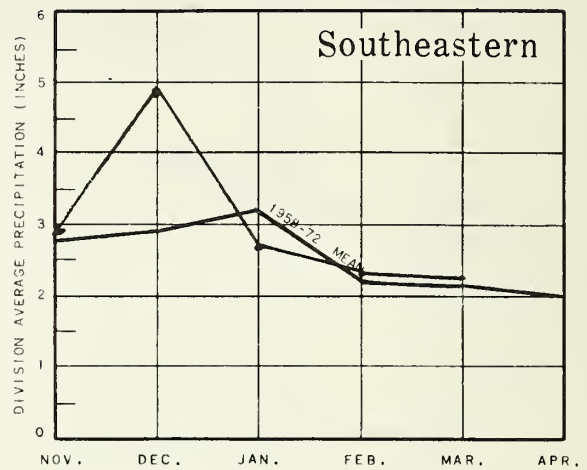
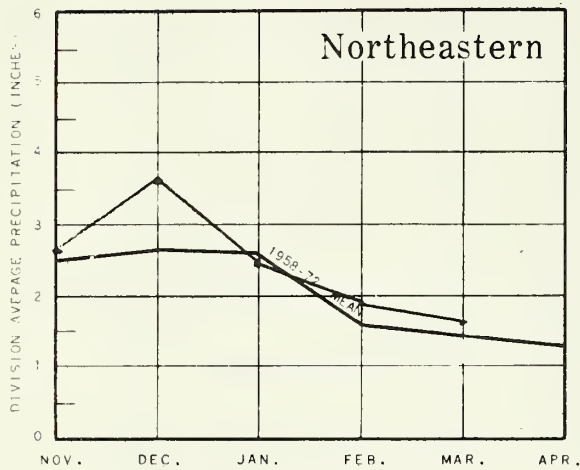


*Selected Snow Survey Courses by Soil Conservation Service*

# WASHINGTON VALLEY PRECIPITATION

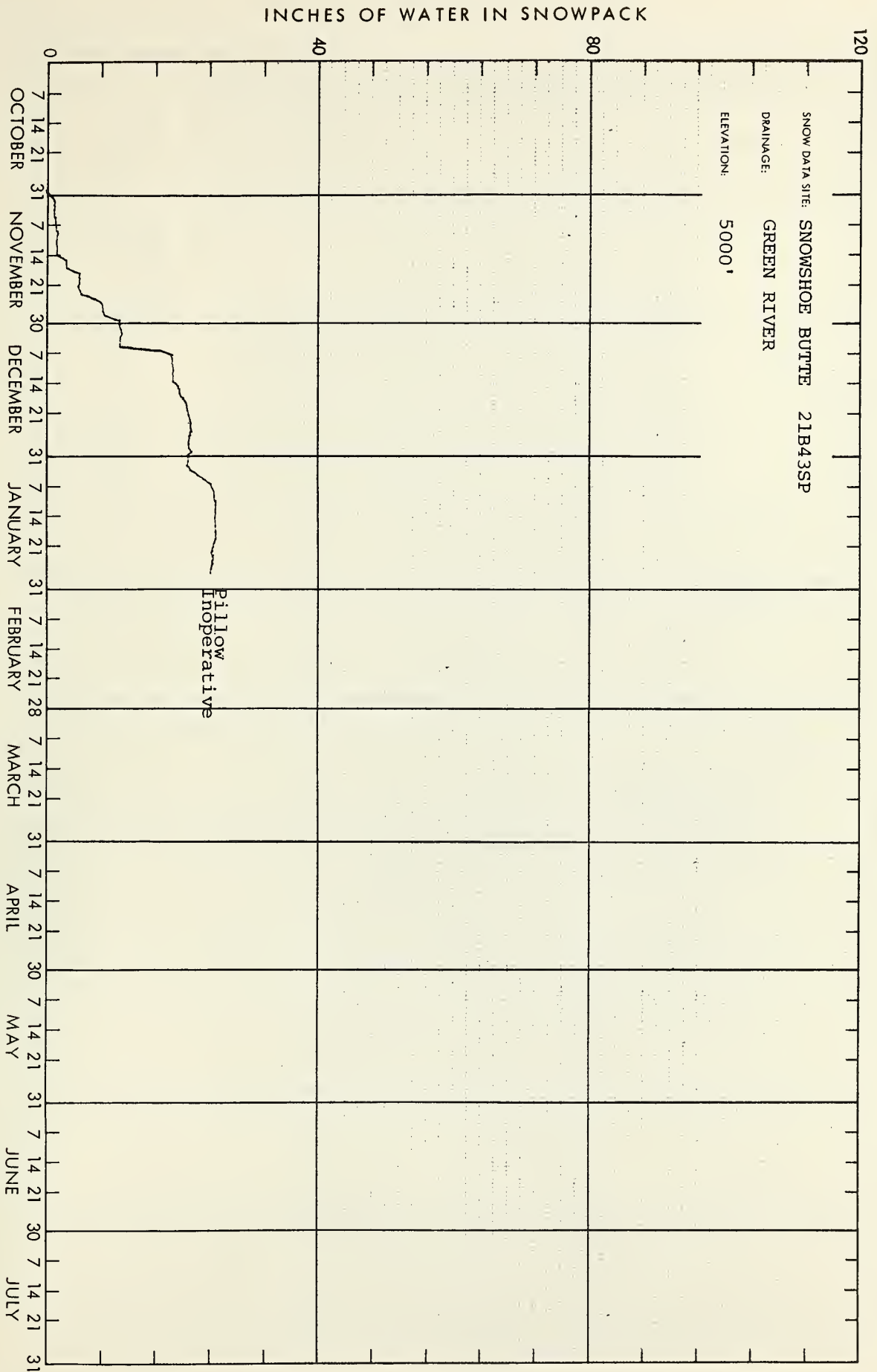
1977 - 1978

## DRAINAGE AREAS

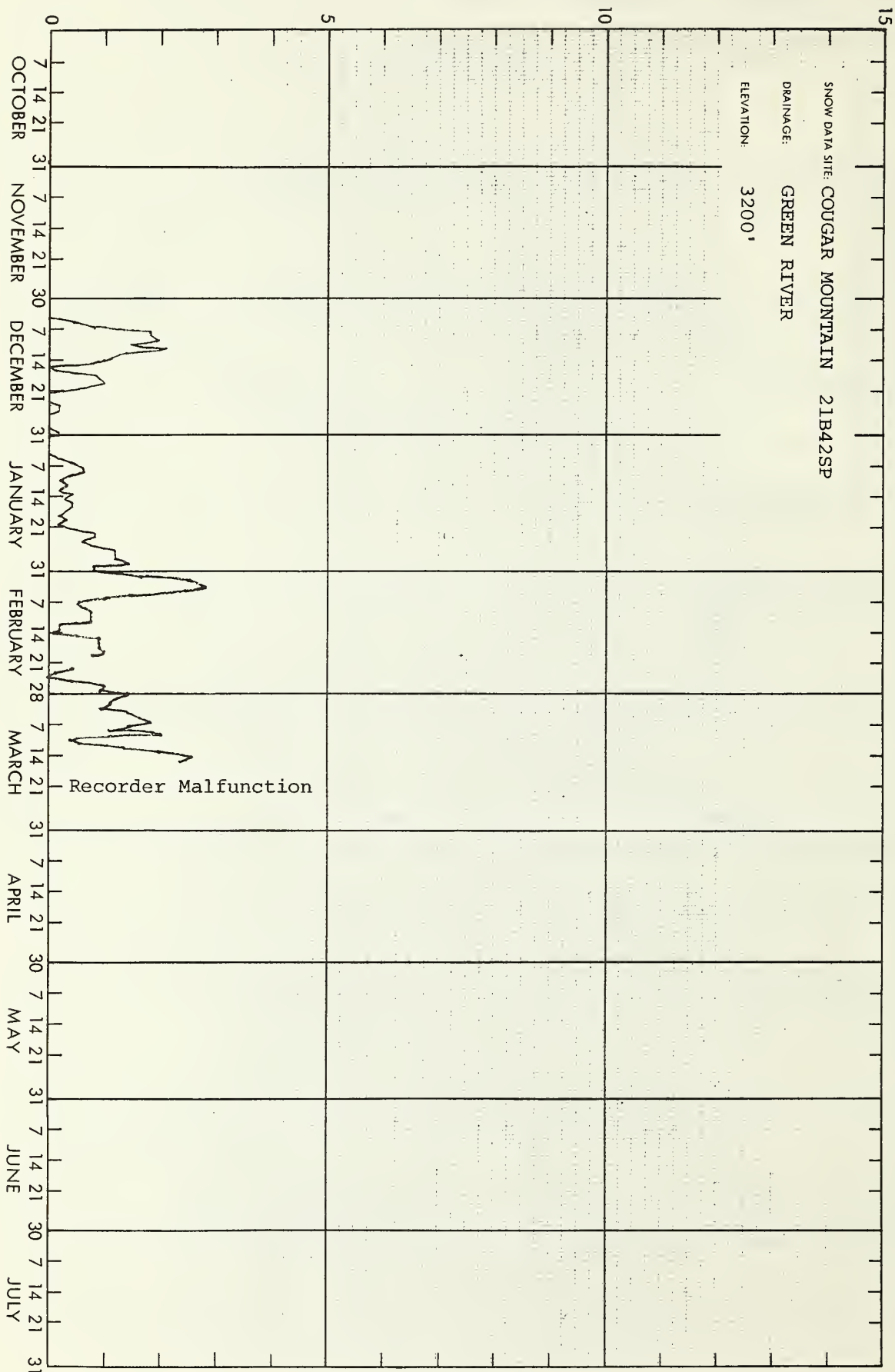


Preliminary Analysis by National Weather Service

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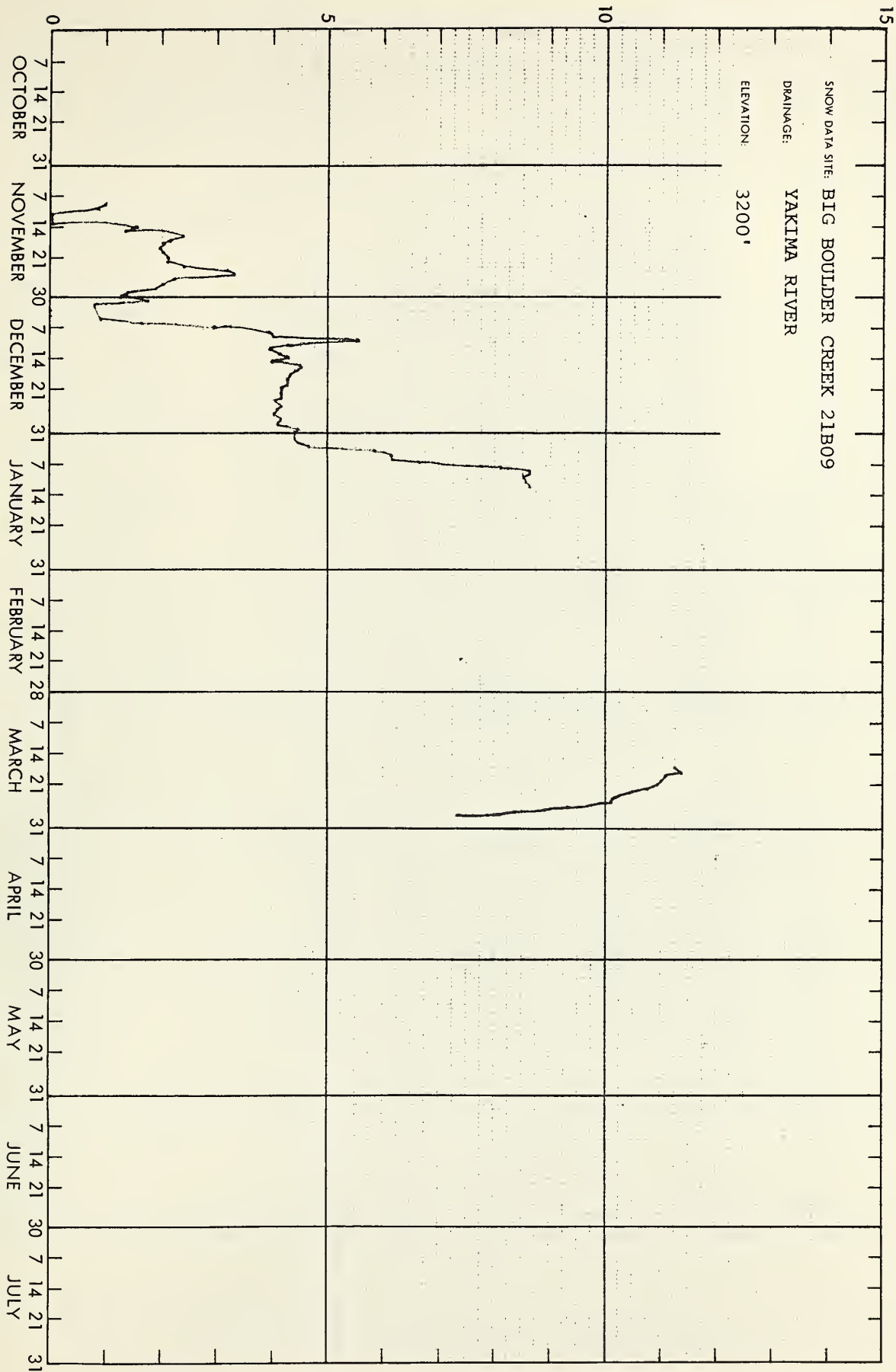


INCHES OF WATER IN SNOWPACK





## INCHES OF WATER IN SNOWPACK



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INCHES OF WATER IN SNOWPACK

60

40

20

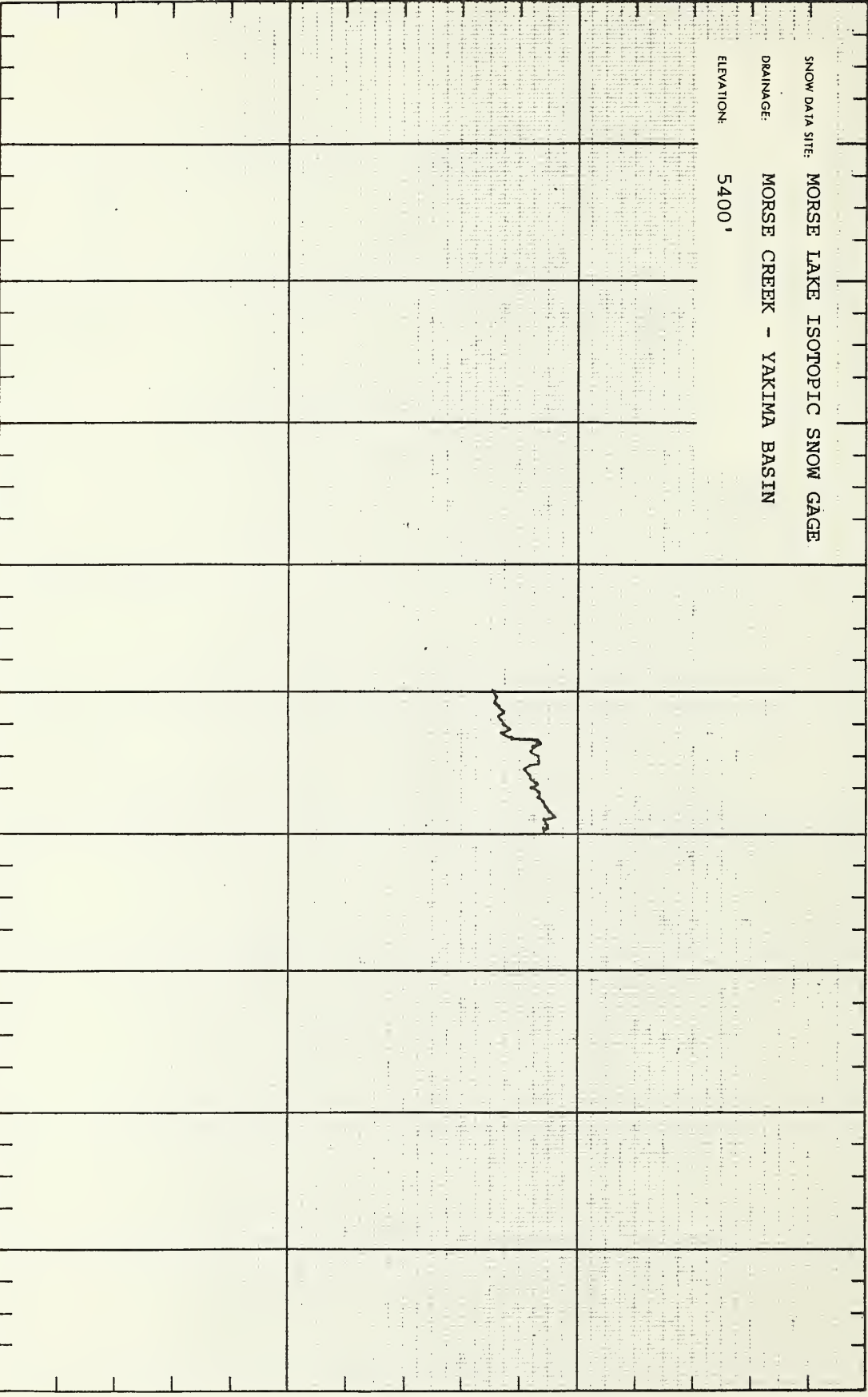
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SNOW DATA SITE: MORSE LAKE ISOTOPIC SNOW GAGE

DRAINAGE: MORSE CREEK - YAKIMA BASIN

ELEVATION: 5400'

OCTOBER 7 14 21 31 NOVEMBER 7 14 21 30 DECEMBER 7 14 21 31 JANUARY 7 14 21 31 FEBRUARY 7 14 21 28 MARCH 7 14 21 31 APRIL 7 14 21 30 MAY 7 14 21 31 JUNE 7 14 21 30 JULY 7 14 21 31



## SNOW DATA TO APRIL 1, 1978 - APPENDIX 1

**SNOW**

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

U P P E R C O L U M B I A D R A I N A G EPEND OREILLE RIVER

Baree Creek	15B11	5500	3/29	83	40.6	29.5	49.4
Baree Midway	15B16	4600	3/29	70	30.6	23.8	37.7
Baree Trail	15B15	3800	3/29	15	5.8	3.8	9.6
Benton Meadow	16A02	2344	3/28	4	1.5	0.0	3.4
Benton Spring	16A03	4900	3/28	39	16.7	7.8	19.4
Boyer Mountain	17A02	5250	3/27	65	25.6	11.4	27.9
Brush Creek Timber	14A13	5000	3/29	23	8.8	5.4	13.1
Bunchgrass Meadow	17A01	5000	3/30	66	29.1	13.4	31.4
Chewelah	17A04	4923	4/1	38	15.5	8.8	18.5
Heart Lake Trail	14C10	4800	3/31	44	18.1	11.6	23.4
Hoodoo Basin	15C10	6000	3/31	108	47.7	23.0	53.8
Hoodoo Creek	15C01	5900	3/31	100	43.5	22.4	50.3
Lookout	15B02	5250	3/13	88	33.8	15.4	35.6
			3/29	74	32.2	18.6	38.1
Mosquito Ridge	16A04A	5100	3/27	78	33.2	19.6	40.3
Nelson	19-Can	3050	3/30	33	12.2	8.7	15.7*
Schweitzer Bowl	16A06	4500	3/30	51	23.1	17.8	31.7
Schweitzer Ridge	16A05	6100	3/30	102	48.2	21.4	48.3
Smith Creek	16A01	4800	3/31	89	37.6	25.1	48.5
Winchester Creek	17A03	2970	3/27	26	9.6	4.6	11.8

KETTLE RIVER

Barnes Creek	90-Can	5300	3/31	50	20.4	18.0	21.2*
Big White Mtn.	154-Can	5500	3/30	55	20.9	14.1	20.9*
Bluejoint Mtn.	244-Can	7500	3/31	70	28.2	14.9	14.9*
Boulder Road	18A02	1450	3/28	0	0.0	0.0	2.6
Butte Creek	18A03	4070	3/28	26	9.5	5.8	10.1
Cabin Creek	18A08	3170	3/28	20	7.1	4.5	9.2
Carmi	126-Can	4100	3/30	20	5.4	4.6	6.7*
Farron # 1	17-Can	4000	3/30	37	12.8	6.8	13.4*
Farron # 2	243-Can	4000	3/30	36	13.5	7.6	13.5*
Goat Creek	18A04	3595	3/28	14	5.4	1.8	6.0
Graystoke Lake	5-Can	5950	3/30	87	16.2	11.4	22.3*
Monashee Pass	48A-Can	4500	3/31	36	13.8	12.4	14.1*
Old Glory Mountain	42-Can	7000	3/31	80	31.7	14.1	28.8*
Snow Caps Creek	18A05	2150	3/28	0	0.0	0.0	2.3
Snow Caps Trail	18A06	2720	3/28	10	4.1	1.4	5.7
Summit G.S.	18A07	4600	3/28	22	8.0	4.4	8.6
Trapping Creek Lower	166-Can	3050	3/30	12	3.7	2.2	3.9*
Trapping Creek Upper	165-Can	4450	3/30	28	8.3	8.6	10.4*

# Average based on 1958-72 average

\* Average for years of record

## SNOW DATA TO APRIL 1, 1978 - APPENDIX 2

**SNOW**

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

COLVILLE RIVER

Baird	17A06	3215	4/1	12	4.1	0.0	5.7
Carlson	18A09	2885	4/1	0	0.0	0.0	2.6
Chewelah	17A04	4925	4/1	38	15.5	8.8	18.5
Stranger Mountain	17A05	4990	4/1	26	10.8	8.0	14.6
Togo	18A10	3370	4/1	27	10.2	4.8	12.5

SPOKANE RIVER

Above Burke	15B08	6100	3/29	47	18.5	15.3	25.6
Above Roland	15B07	4350	3/27	70	26.8	15.0	35.8
Below Roland	15B06	3770	3/27	25	11.6	5.1	17.4
Copper Ridge	16B02	4800	3/30	35	16.0	14.6	30.1
Forty-nine Meadows	15B03	5000	3/31	54	19.8	13.6	34.9
Fourth of July Summit	16B03	3100	3/30	0	0.0	6.0	7.8
Granite Peak	15B13A	6000	3/31	94	34.4	19.8	47.5
Kellogg Peak	16B05A	5560	3/27	58	24.8	15.2	34.7
Lookout	15B02	5250	3/13	88	33.8	15.4	35.6
			3/29	74	32.2	18.6	38.1
Lost Lake	15B14A	6000	3/31	113	44.3	25.2	62.1
Lower Sands Creek	16B01	3400	3/30	38	16.2	12.1	20.7
Medicine Ridge	15B04A	6150	4/1	Not Measured		20.5	48.1
Mosquito Ridge	16A04A	5110	3/27	78	33.2	19.6	40.3
Roland Summit	15B05A	5200	3/27	82	36.6	16.0	39.2
Sherwin	16C01	3200	3/27	18	6.6	6.9	13.8
Sunset	15B09A	5600	3/27	74	30.5	18.0	39.3

SANPOIL RIVER

Sherman Creek Pass	18A01	5350	3/28	35	12.1	6.0	15.5
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OKANOGAN RIVER

Aberdeen Lake	6A-Can	4300	3/31	19	6.1	5.1	6.2*
Blackwall Mountain	100-Can	6250	3/29	73	30.9	19.4	35.2*
Bouleau Lake	234-Can	4580	3/27	44	15.0	7.9	16.6*
Brenda Mine	193-Can	4800	3/30	32	13.3	7.5	14.4*
Brookmere	27-Can	3200	3/31	24	7.6	5.0	9.8*
Carrs Landing Upper	168-Can	3200	3/29	8.7	3.1	2.8	3.7*
Clark +	19A08a	7000	4/1	Not Measured		-	23.3
Enderby	130-Can	6250	3/28	109	42.1	29.5	39.7*
Esperon Creek Lower	164-Can	4400	3/31	33	11.9	4.6	13.0*
Esperon Creek Middle	163-Can	4700	3/31	39	15.8	8.8	16.6*
Esperon Creek Upper	162-Can	5400	3/31	48	18.7	10.7	20.7*

# Average based on 1958-72 average

\* Average for years of record

+ Snow water equivalent estimated from aerial stadia observation.



## SNOW DATA TO APRIL 1, 1978 - APPENDIX 3

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	Number	Elevation				Last Year	Average #

## OKANOGAN RIVER (Cont.)

Freezeout Meadows New	20A38	5000	3/31	57	24.0	16.0	29.9
Graystoke Lake	5-Can	5950	3/30	87	16.2	11.4	22.3*
Hamilton Hill	107-Can	4900	3/28	39	16.9	9.7	15.8*
Harts Pass	20A05A	6500	3/27	108	47.4	22.0	47.2
Horseshoe Basin +	19A05a	7000	3/30	48	16.3	11.8	13.5
Isintok Lake	152-Can	5510	4/1	27	9.4	3.5	8.5*
Lost Horse Mountain	105-Can	6300	3/31	32	6.8	6.5	9.6*
Loup Loup	19A07	4650	3/31	24	9.4	1.6	9.3
McCulloch	4-Can	4200	3/31	17	5.2	5.2	6.8*
Missezula Mountain	106-Can	5100	3/27	30	11.8	5.5	8.9*
Mission Creek	5A-Can	6000	3/30	55	20.8	16.8	20.4*
Monashee Pass	48A-Can	4500	3/31	36	13.8	12.4	14.1*
Mount Kobau	156-Can	5950	3/31	41	12.4	5.6	13.9*
Muckamuck +	19A09a	6390	3/30	50	17.0	6.2	17.8
Mutton Creek No. 1	19A01	5700	3/29	41	14.6	4.7	14.2
Mutton Creek No. 2	19A04	6000	3/29	41	13.3	5.3	15.4
Mutton Creek No. 2SP	19A11SP	6000	3/29	-	16.5	2.8	New
New Copper Mountain	46A-Can	4300	3/29	11	2.8	2.3	5.3*
New Penticton Res. #2	183-Can	5225	3/31	30	9.4	5.7	9.5*
Nickel Plate Mtn.	47-Can	6200	3/30	27	10.2	7.0	8.2*
Oyama Lake	203-Can	4400	3/28	23	8.1	5.5	7.8*
Paysayten +	20A28a	4300	3/30	24	8.2	10.6	16.0
Postill Lake	55-Can	4500	3/31	24	7.9	8.1	9.2*
Quartette Lake	34-Can	4000	3/29	26	10.6	5.5	14.7*
Rusty Creek	19A03	4000	3/29	20	6.6	0.6	7.0
Salmon Meadows	19A02	4500	3/29	28	9.0	3.1	10.3
Silver Star Mountain	99-Can	6050	3/27	81	32.2	19.2	28.7*
Starvation Mtn. +	19A10a	6750	3/30	60	20.4	8.4	21.9
Summerland Reservoir	3A-Can	4200	4/1	24	9.4	4.8	9.4*
Touts Coulee	19A06	2845	3/30	0	0.0	0.5	1.1
Trout Creek	3-Can	4700	3/28	23	7.3	4.2	7.6*
Vaseux Creek	233-Can	4600	3/31	17	5.6	5.0	7.5*
White Rocks Mountain	70-Can	6000	3/30	64	25.5	13.3	23.9*

## METHOW RIVER

Billy Goat Pass +	20A10a	6409	3/30	69	23.5	-	32.0
Dollar Watch +	20A29a	7000	4/1	Not Measured		-	29.3
Harts Pass	20A05A	6500	3/27	108	47.4	22.0	47.2
Horseshoe Basin +	19A05a	7000	3/30	48	16.3	11.8	13.5
Loup Loup	19A07	4650	3/31	24	9.4	1.6	9.3
Mutton Creek No. 1	19A01	5700	3/29	41	14.6	4.7	14.2
Mutton Creek No. 2	19A04	6000	3/29	41	13.3	5.3	15.4

# Average based on 1958-72 average

\* Average for years of record

+ Snow water equivalent estimated from aerial stadia observation.

## SNOW DATA TO APRIL 1, 1978 - APPENDIX 4

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

METHOW RIVER (Cont.)

Mutton Creek No. 2SP	19A11SP	6000	3/29	-	16.5	2.8	New
Rusty Creek	19A03	4000	3/29	20	6.6	0.6	7.0
Salmon Meadows	19A02	4500	3/29	28	9.0	3.1	10.3
War Creek Pass	20A31a	6500	4/1	Not Measured		-	43.5

CHELAN LAKE BASIN

Cloudy Pass +	22A22a	6500	4/1	Not Measured		22.8	54.0
Greenwood Flat +	20A25a	3540	4/1	Not Measured		-	24.8
Little Meadows +	20A24a	5275	4/1	Not Measured		-	45.8
Lyman Lake	20A23A	5900	3/28	133	59.3	28.3	61.5
Park Creek Flat +	20A13a	2220	4/1	Not Measured		-	34.3
Park Creek Ridge	20A12A	4600	3/29	100	46.6	19.1	46.1
Petersons +	20A16a	3730	4/1	Not Measured		-	32.2
Rainy Pass	20A09	4780	3/27	96	43.4	22.8	41.6
Safety Harbor	20A30A	6300	4/1	Not Measured		-	29.9
War Creek Pass +	20A31a	6500	4/1	Not Measured		-	43.5

ENTIAT RIVER

Blue Creek G.S.	20B28a	5425	3/29	96	45.2	23.0	New
Brief	20B19	1600	3/27	8.1	3.7	0.0	4.0
Entiat Meadows +	20A33a	4540	3/29	102	48.0	19.2	48.1
Entiat River Trail +	20A34a	3325	3/29	56	23.6	8.6	21.3
Four Mile Ridge +	20B27a	6800	3/29	96	45.2	15.4	New
Fox Camp +	20A36a	6510	3/29	152	71.6	27.5	59.0
Pope Ridge	20B20	3540	3/29	49	20.7	4.1	16.9
Pugh Ridge +	20A32a	6725	3/29	97	45.7	15.7	39.6
Shady Pass	20A37	6200	3/30	78	36.8	10.3	New
Snow Brushy +	20A35a	3910	3/29	93	39.2	20.7	40.9
Tommy Creek +	20B21a	4900	3/29	52	24.5	7.0	27.1

WENATCHEE RIVER

Berne-Mill Creek	21B23	2925	3/13	74	28.0	9.1	-
			3/28	60	27.1	12.0	27.6
Berne-Mill Creek New	21B41SP	3240	3/28	41	18.6	10.2	23.3
Blewett Pass No. 2	20B02	4270	3/24	38	15.6	4.4	16.5
Chiwaukum G.S.	20B16	1810	3/13	33	13.4	2.8	-
			3/28	23	8.9	0.0	10.5
Fish Lake	21B04	3371	3/28	61	26.5	15.1	35.1
Lake Wenatchee	20B05	1970	3/13	44	17.0	4.6	-
			3/28	32	13.4	4.4	11.9

# Average based on 1958-72 average.

+ Snow water equivalent estimated from aerial stadia observation.

## SNOW DATA TO APRIL 1, 1978 - APPENDIX 5

SNOW DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	Number	Elevation				Last Year	Average #

WENATCHEE RIVER (Cont.)

Leavenworth R.S.	20B17	1127	3/13	1.8	0.8	0.0	-
			3/29	0	0.0	0.0	0.7
Lyman Lake	20A23A	5900	3/28	133	59.3	28.3	61.5
Merritt	20B18	2140	3/13	50	21.4	4.7	-
			3/28	35	12.9	2.9	14.9
Stevens Pass	21B01	4070	3/13	116	50.0	19.1	50.8
			3/28	102	46.3	25.9	53.7
Stevens Pass Sand Shed	21B45	3700	3/13	86	33.5	10.3	-
			3/28	68	32.0	15.4	-

SQUILCHUCK CREEK

Beehive Springs	20B03	4400	3/31	16	7.1	1.4	7.8
Scout-A-Vista	20B04	3400	3/31	17	7.3	0.3	6.9

STEMILT CREEK

Jump-Off	20B08	4450	3/29	25	10.8	1.6	8.0
Stemilt Slide	20B06	5000	3/29	31	13.7	2.7	15.5
Upper Wheeler	20B07	4400	3/29	17	7.3	1.1	9.0

COLOCKUM CREEK

Colockum Creek Upper	20B22	5300	3/29	31	14.3	3.4	-
Colockum Creek Lower	20B23	4300	3/29	23	10.5	1.2	-
Trough # 2	20B25SP	5310	3/29	40	18.0	3.2	New

YAKIMA RIVER

Ahtanum R.S.	21C11	3100	3/28	12	4.4	0.0	5.2
Big Boulder Creek	21B09	3200	3/28	24	10.0	7.3	18.0
Blewett Pass No. 2	20B02	4270	3/24	38	15.6	4.4	16.5
Bumping Lake	21C08	3450	3/17	35	13.6	2.9	16.9
			3/28	24	10.0	3.1	16.2
Bumping Lake New	21C36	3400	3/17	42	16.9	3.3	21.4
			3/28	33	14.5	4.4	20.7
Cayuse Pass	21C06	5300	4/3	155	70.4	38.1	90.2
Colockum Pass	20B09	5370	3/31	44	21.0	3.8	17.4
Cooke Creek	20B10	4123	3/30	0	0.0	0.0	5.1
Corral Pass	21B13	6000	3/29	69	30.5	16.5	41.6
Fish Lake	21B04	3371	3/28	61	26.5	15.1	35.1
Green Lake	21C10	6000	3/28	74	32.5	12.0	36.2
Grouse Camp	20B11	5385	3/30	41	18.4	4.9	17.1

# Average based on 1958-72 average.

## SNOW DATA TO APRIL 1, 1978 - APPENDIX 6

**SNOW**

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

YAKIMA RIVER (Cont.)

High Creek	20B12	2930	3/30	0	0.0	0.0	2.3
Joe Lake +	21B46a	4624	3/29	123	51.7	40.9	-
Lake Cle Elum	21B14M	2200	3/13	18	6.5	0.0	7.8
			3/30	0	0.0	0.0	4.5
Lemah Creek +	21B47a	3327	3/29	63	26.5	21.1	-
Manashtash	20C01	3935	3/29	Trace	0.0	0.0	2.2
Morse Lake	21C17	5400	3/30	107	48.7	19.9	61.9
Nanum	20B13	3875	3/30	Trace	0.0	0.0	8.2
Olallie Meadows	21B02	3625	3/29	60	26.4	22.6	48.8
Satus Pass	20D01	4030	3/30	0	0.0	0.0	8.6
Stampede Pass Sp	21B10	3860	3/15	95	43.0	9.0	41.2
			3/31	57	29.8	14.4	43.4
Trail Creek	20B14	3360	3/30	0	0.0	0.0	0.1
Tunnel Avenue	21B08	2450	3/14	47	15.5	5.3	24.0
			3/30	29	11.2	7.4	24.1
Van Epps Pass +	20B26a	5925	3/29	104	43.7	28.4	-
Walters Flat	20B15	3360	3/30	Trace	0.0	0.0	5.3
Waptus Lake +	21B49a	3024	3/29	87	36.5	21.9	-
White Pass (E. Side)	21C28	4500	3/20	53	20.1	4.2	24.7
			3/31	40	17.4	7.4	25.9

AHTANUM CREEK

Ahtanum R.S.	21C11	3100	3/28	12	4.4	0.0	5.2
Green Lake	21C10	6000	3/28	74	32.5	12.0	36.2

L O W E R C O L U M B I A D R A I N A G EASOTIN CREEK

Spruce Springs	17C04	5700	3/27	41	18.5	10.4	26.6
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MILL CREEK

Homestead	17C01	4030	3/28	0	0.0	4.8	7.3
Martin Springs	17C02	4400	3/28	9.1	3.5	7.3	14.2
Tollgate	18D3M	5070	3/28	37	15.1	13.1	25.1

KLICKITAT RIVER

Satus Pass	20D01	4030	3/30	0	0.0	0.0	8.6
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# Average based on 1958-72 average.

+ Snow water equivalent estimated from aerial stadia observation.



## SNOW DATA TO APRIL 1, 1978 - APPENDIX 7

**SNOW**

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

WHITE SALMON RIVER

Cultus Creek	21C12	4000	3/27	84	37.0	21.8	49.4
Surprise Lakes	21C13A	4250	3/27	78	34.3	19.3	53.9

WIND RIVER

Old Man Pass	21D19	3100	3/27	0	0.0	9.6	19.7
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LEWIS RIVER

Blue Lake +	21C22a	4800	3/27	158	69.5	41.6	84.8
Bob's Trail	21C21	2200	3/27	0	0.0	6.8	15.1
Clamity Ridge +	22D01a	2500	3/27	0	0.0	7.1	5.6
Council Pass +	21C18a	4200	3/27	56	24.6	23.0	42.9
Cultus Creek	21C12	4000	3/27	84	37.0	21.8	49.4
Divide Meadow +	21C29a	5600	3/27	92	40.5	27.7	60.6
Grand Meadow	21C25	3500	3/27	23	9.4	10.1	27.7
Lone Pine Shelter	21C26	3800	3/27	44	18.0	18.9	43.3
Marble Mountain +	22C05a	3200	3/27	10	4.8	17.3	38.2
New Muddy River	22C06	2000	3/27	0	0.0	3.0	9.5
Old Man Pass	21D19	3100	3/27	0	0.0	9.6	19.7
Plains of Abraham +	22C01a	4400	3/27	130	57.2	33.0	71.8
Smith Creek Road	22C04	2100	3/27	0	0.0	0.8	17.7
Spencer Meadow +	21C20a	3400	3/27	0	0.0	14.9	25.7
Surprise Lakes	21C13A	4250	3/27	78	34.3	19.3	53.9
Table Mountain +	21C24a	4200	3/27	82	36.1	26.2	48.8
Timbered Peak +	21D18a	3000	3/27	0	0.0	14.9	17.8

COWLITZ RIVER

Cayuse Pass	21C06	5300	4/3	155	70.4	38.1	90.2
Plains of Abraham +	22C01a	4400	3/27	130	57.2	33.0	71.8
White Pass (E. Side)	21C28	4500	3/20	53	20.1	4.2	24.7
			3/31	40	17.4	7.4	25.9

PUGET SOUND DRAINAGEWHITE RIVER

Cayuse Pass	21C06	5300	4/3	155	70.4	38.1	90.2
Corral Pass	21B13	6000	3/29	69	30.5	16.5	41.6
Morse Lake	21C17	5400	3/30	107	48.7	19.9	61.9

# Average based on 1958-72 average.

+ Snow water equivalent estimated from aerial stadia observation.

## SNOW DATA TO APRIL 1, 1978 - APPENDIX 8

**SNOW**

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

GREEN RIVER

Airstrip	21B24	1800	4/3	0	0.0	0.0	1.3
Charley Creek	21B25	1200	4/3	0	0.0	0.0	0.0
Cougar Mountain SP	21B42SP	3200	3/30	0	0.0	10.4	-
Grass Mtn. No. 2	21B27	2900	4/3	0	0.0	8.8	24.4
Grass Mtn. No. 3	21B28	2100	4/3	0	0.0	2.2	4.4
Lester Creek	21B29	3100	4/3	26	9.3	12.8	27.0
Lynn Lake	21B50	4000	4/3	0	0.0	21.8	-
Sawmill Ridge	21B31	4700	4/3	54	22.8	17.1	41.5
Snowshoe Butte SP	21B43SP	5000	3/29	88	39.4	24.2	-
Stampede Pass SP	21B10	3860	3/15	95	43.0	9.0	41.2
			3/31	57	29.8	14.4	43.4
Twin Camp	21B30	4100	4/3	26	10.7	11.8	25.9

CEDAR RIVER

City Cabin	21B03	2390	3/27	0	0.0	7.8	15.5
Mt. Gardner	21B21	3300	3/27	0	0.0	10.2	18.0
Mt. Lindsay	21B16	2500	3/27	0	0.0	6.6	15.9
Mt. Washington New	21B15	3000	3/27	0	0.0	6.8	7.5
Rex River	21B17	2400	3/27	0	0.0	9.4	13.5
S. F. Cedar	21B06	3000	3/27	0	0.0	8.0	20.6
Tinkham Creek	21B20	3400	3/27	11	4.7	11.2	23.7

SNOQUALMIE RIVER

Alpine Meadow	21B48	3500	3/28	41	18.9	24.1	-
Lake Elizabeth	21B19	2900	3/29	40	19.3	23.2	48.5
Olallie Meadows	21B02	3625	3/29	60	26.4	22.6	48.8
S. F. Tolt	21B18	1900	3/28	0	0.0	0.0	0.8

SKYKOMISH RIVER

Lake Elizabeth	21B19	2900	3/29	40	19.3	23.2	48.5
Stevens Pass	21B01	4070	3/13	116	50.0	19.1	50.8
			3/28	102	46.3	25.9	53.7
Stevens Pass Sand Shed	21B45	3700	3/13	86	33.5	10.3	-
			3/28	68	32.0	15.4	-

# Average based on 1958-72 average.

## SNOW DATA TO APRIL 1, 1978 - APPENDIX 9

**SNOW**

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

SKAGIT RIVER

Beaver Creek Trail	21A04	2200	3/28	14	6.2	3.6	12.6
Beaver Pass	21A01	3680	3/28	52	20.9	9.9	33.7
Brown Top +	21A28a	6000	3/28	130	55.0	30.4	-
Cloudy Pass	20A22a	6500	4/1	Not Measured		22.8	54.0
Devils Park	20A04A	5900	3/27	101	43.8	21.7	45.6
Freezeout Cr. Trail	20A01	3500	3/31	18	5.9	4.8	12.5
Freezeout Meadows New	20A38	5000	3/31	57	24.0	16.0	29.9
Granite Creek	21A29	3500	3/27	35	13.8	9.8	-
Harts Pass	20A05A	6500	3/27	108	47.4	22.0	47.2
Klesilkwa	35B-Can	3700	3/31	13	5.0	7.4	15.5*
Lyman Lake +	20A23A	5900	3/28	133	59.3	28.3	61.5
Meadow Cabins	20A08	1900	3/28	4.2	1.5	1.1	6.0
New Hozomeen Lake	21A30	2800	3/31	13	4.7	4.1	-
New Tashme	26A-Can	2500	3/28	15	6.1	4.8	11.0*
Quartette Lake	34-Can	4000	3/29	26	10.6	5.5	14.7*
Rainy Pass	20A09	4780	3/27	96	43.4	22.8	41.6
Thunder Basin	20A07	4200	3/28	48	18.4	11.5	23.9

BAKER RIVER

Baker Pass +	21A27a	4900	4/1	Marker Missing		46.5	-
Dock Butte	21A11A	3800	3/30	91	43.2	34.2	71.3
Easy Pass	21A07A	5200	3/30	182	86.3	39.2	87.0
Jasper Pass	21A06A	5400	3/31	170	77.6	47.8	93.6
Komo Kulshan	21A17	800	3/30	0	0.0	0.0	6.0
Marten Lake	21A09A	3600	3/31	112	52.1	43.8	78.1
Mount Blum +	21A18a	5800	3/31	134	61.6	35.1	-
Panorama New	21A26	4300	3/12	113	52.8	29.6	-
			3/31	107	53.5	37	
Rocky Creek	21A12A	2100	3/30	16	7.9	15.6	29.2
Schreibers Meadow	21A10A	3400	3/30	86	37.9	33.1	65.6
S. F. Thunder Creek	21A14A	2200	3/30	0	0.0	3.1	5.3
Sulphur Creek	21A13	1600	3/30	0	0.0	4.7	13.6
Three Mile Creek	21A15	1600	3/30	0	0.0	0.0	1.7
Watson Lakes	21A08A	4500	3/30	101	49.5	34.0	71.2

NOOKSACK RIVER

Bald Mountain +	21A19a	4400	4/3	70	38.5	29.8	51.0
Canyon +	21A20a	5100	4/3	70	28.5	45.3	60.0
Glacier Creek	21A23	3700	4/1	7.6	4.8	17.6	23.4
Panorama New	21A26	4300	3/12	113	52.8	29.6	-
			3/31	107	53.5	37.3	-
Twin Lakes +	21A21a	5200	4/3	70	38.5	45.3	79.1

# Average based on 1958-72 average.

\* Average for years of record.

+ Snow water equivalent estimated from aerial stadia observation.

## SNOW DATA TO APRIL 1, 1978 - APPENDIX 10

**SNOW**

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

O L Y M P I C   P E N I N S U L ADUNGENESS RIVER

Deer Park	23B04	5200	3/31	31	11.6	12.6	24.1
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MORSE CREEK

Cox Valley	23B14	4500	3/31	71	28.0	22.2	-
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ELWHA RIVER

Hurricane	23B03	4500	3/30	31	11.9	14.1	26.1
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# Average based on 1958-72 average.



# Agencies Assisting with Snow Surveys

## GOVERNMENT AGENCIES

### Canada:

Ministry of the Environment, Water  
Investigations Branch, Victoria, British Columbia

### States:

Washington State Department of Ecology  
Washington State Department of Natural Resources

### Federal:

Department of the Army  
Corps of Engineers  
U. S. Department of Agriculture  
Forest Service  
U. S. Department of Commerce  
NOAA, National Weather Service  
U. S. Department of the Interior  
Bonneville Power Administration  
Bureau of Reclamation  
Geological Survey  
National Park Service

## PUBLIC AND PRIVATE UTILITIES

Chelan County P.U.D.  
Pacific Power and Light Company  
Puget Sound Power and Light Company  
Washington Water Power Company

## OTHER PUBLIC AGENCIES

Okanogan Irrigation District  
Wenatchee Heights Irrigation District

## MUNICIPALITIES

City of Tacoma  
City of Seattle

*Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.*

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with the Snow Survey"*